REMARKS

The Office Action dated April 27, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-17, 19-22, and 24-31 have been amended to more particularly point out and distinctly claim the subject matter of the invention. New claims 32-34 have been added. No new matter has been added. Therefore, claims 1-34 are currently pending in the application and are respectfully submitted for consideration.

The Office Action objected to claim 14 because claim 14 depends on claim 15, which the examiner believed was a typographical error, and stated that claim 15 should depend on claim 13. Claim 14 has been amended to depend on claim 13, rather than claim 15. As such, Applicants respectfully assert that this objection is rendered moot and should be withdrawn.

The Office Action objected to claims 27 and 30 because "computer program for executing a computer process should read along the lines of computer readable medium encoded with a computer program; a computer readable medium (storing a, embodied with a, encoded with a, having a stored, having an encoded) computer program or the like." Claims 27 and 30 have been amended to recite "embodied on a computer readable medium executed by a processor." As such, Applicants respectfully assert that this objection is rendered moot and should be withdrawn.

The Office Action rejected claims 1-31 under 35 U.S.C. § 102(b) as being anticipated by WO 00/0732 ("Salinger.") The rejection is respectfully traversed for the following reasons.

Claim 1, upon which claims 2-8 are dependent, recites a method of allocating resources in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The method includes generating a sampled receive signal from a wirelessly received signal. The method further includes deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The method further includes identifying an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level threshold. The method further includes reducing transmit resources from the interfered portion of the signal space.

Claim 9, upon which claims 10-12 are dependent, recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes a sampling unit configured to generate a sampled receive signal from a wirelessly received signal. The transceiver further includes a deriving unit configured to derive an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The transceiver further includes an identifying unit configured to identify an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference

level threshold. The transceiver further includes a transmitting unit configured to transmit information on the interfered portion of the signal space to a second transceiver.

Claim 13, upon which claims 14-19 are dependent, recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes a sampling unit configured to generate a sampled receive signal from a wirelessly received signal. The transceiver further includes a deriving unit configured to derive an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The transceiver further includes an identifying unit configured to identify an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level threshold. The transceiver further includes a transmit resource allocation unit configured to reduce transmit resources from the interfered portion of the signal space.

Claim 20, upon which claims 21-24 are dependent, recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes a receiving unit configured to receive information on an interfered portion of the signal space from a second transceiver. The transceiver further includes a transmit resource allocation unit configured to reduce transmit resources from the interfered portion of the signal space on the basis of the information.

Claim 25, upon which claim 26 is dependent, recites a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The wireless telecommunications system includes a generating unit configured to

generate a sampled receive signal from a wirelessly received signal. The wireless telecommunications system further includes a deriving unit configured to derive an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The wireless telecommunications system further includes an identifying unit configured to identify an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level threshold. The wireless telecommunication system further includes a reducing unit configured to transmit resources from the interfered portion of the signal space.

Claim 27, upon which claims 28-29 are dependent, recites a computer program embodied on a computer readable medium executed by a processor in a wireless telecommunication system, wherein signals are transmitted over a signal space. The computer program is configured to perform receiving as input a sampled receive signal generated from a wirelessly received signal. The computer program is further configured to perform deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The computer program is further configured to perform identifying an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level threshold. The computer program is further configured to perform outputting information on the interfered portion of the signal space.

Claim 30, upon which claim 31 is dependent, recites a computer program embodied on a computer readable medium executed by a processor in a wireless

telecommunications system, wherein wireless signals are transmitted over a signal space. The computer program is configured to perform receiving as input information on an interfered portion of the signal space. The computer program is further configured to perform reducing transmit resources from the interfered portion of the signal space on the basis of the information.

Claim 32 recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes sampling means for generating a sampled receive signal from a wirelessly received signal. The transceiver further includes deriving means for deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The transceiver further includes identifying means for identifying an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level threshold. The transceiver further includes transmitting means for transmitting information on the interfered portion of the signal space to a second transceiver.

Claim 33 recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes sampling means for generating a sampled receive signal from a wirelessly received signal. The transceiver further includes deriving means for deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal. The transceiver further includes identifying means for identifying an interfered portion of the signal space on the basis of a comparison of the sampled receive signal and the interference level

threshold. The transceiver further includes transmit resource allocation means for reducing transmit resources from the interfered portion of the signal space.

Claim 34 recites a transceiver of a wireless telecommunications system, wherein wireless signals are transmitted over a signal space. The transceiver includes receiving means for receiving information on an interfered portion of the signal space from a second transceiver. The transceiver further includes transmit resource allocation means for reducing transmit resources from the interfered portion of the signal space on the basis of the information.

Thus, according to embodiments of the invention, the iterative statistical analysis provides an effective procedure for identifying the interfered portion of the signal space with a relatively small amount of required a priori information on the interference characteristics. The embodiments of the invention enable de-allocating transmit resources from transmitting signals to the interfered signal space, thus releasing transmit resources to be allocated to the non-interfered signal space.

As will be discussed below, Salinger fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Salinger generally describes a method and apparatus for automatically detecting the presence of an interfering signal in the demodulated output of a quadrature amplitude modulation data communications receiver and retuning a transmitter to avoid the detected interfering signal. Statistical information concerning the received signal is accumulated at a receiver and is analyzed to determine whether a reduction in the received bit-error-

rate is due to the presence of an interferer. If an interferer is determined to be present within the signal transmission bandwidth, then the potentially available transmission band is spectrum analyzed to find a new portion of that band in which the signal can be transmitted free of the interfere. The results of the statistical analysis and the spectral analysis are conveyed back to the transmitter when then readjusts the transmission parameters and forwards the new parameters to the receiver.

Applicants respectfully submit that Salinger fails to disclose, teach or suggest, all of the elements of the present claims. For example, Salinger does not disclose, teach or suggest, at least, "a method of allocating resources in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space," as recited in claim 1; "a transceiver of a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claims 9, 13, 20, and 32-34; "a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claim 25; "a computer program embodied on a computer readable medium executed by a processor in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space," as recited in claims 27 and 30; and "generating a sampled receive signal from a wirelessly received signal;" as recited in claim 1, and similarly recited in claims 9, 13, 25, 27, and 32-33.

Salinger relates to a land-line system, which is prone to intrusive signals. Salinger discloses a method which is focused on wired communications (VDSL communications). The method disclosed by Salinger will not work in wireless communications due to the

different nature of the communication channel and different signal propagation properties.

The method of Salinger relies on the fact that the vector combination of the interferer with a CAP/QAM symbol cluster changes the distribution of sample locations in the cluster from a Rayleigh distribution in the presence of only Gaussian noise to a Ricean distribution in the presence of such an interferer. Salinger uses statistical analysis of the positions of a set of samples in the demodulated symbol constellation to decide whether the distribution is sufficiently shifted towards Ricean to declare that an interferer is present. In other words, Salinger analyses the received sampled signal in order to determine whether the received signal has a form of a Rayleigh distribution or a Rice distribution. If the received samples are determined to be Rician distributed, the presence of an interfering signal is assumed. If the received samples are determined to be Rayleigh distributed, the received signal is considered to be free of interference other than Gaussian noise. The method of Salinger will not work in wireless communications for the following reasons.

The Rice distribution is a generalization of the Rayleigh distribution, wherein the Rice distribution incorporates a so-called bias component. In the Rayleigh distribution, the bias component is zero. In practice, the method of Salinger determines the presence of the bias component to indicate the presence of the interference. However, in wireless communications, the presence of the bias component indicates the presence of a line-of-sight (or a strong reflection) between a radio transmitter and a radio receiver. Thus, the

quality of a communication link is better when the received signal is Rician distributed due to the strong signal component propagated through the line-of-sight path.

In other words, if the method of Salinger was applied to wireless communications, the method of Salinger would incorrectly interpret a line-of-sight path as the presence of an interfering signal. Accordingly, if the method of Salinger was applied to wireless communication, the method would avoid the communication channels providing the line-of-sight signal path. Therefore, application of the method and apparatus disclosed in Salinger to the field of wireless communications would result in undesired and degraded performance of the system.

Furthermore, Salinger makes clear that its method and apparatus are both directed towards wired communications, as opposed to wireless communications. On page 2, Salinger discloses that telephone companies are looking towards the use of very-high-speed digital subscriber lines (VDSL) and discloses that VDSL provides a means to carry such data into the home or business over the existing copper wires used by plain old telephone service (POTS.) Salinger further discloses on pages 2-3, that VDSL transmissions over the telephone wires are subject to radio frequency interference (RFI) from AM radio broadcasts and amateur radio transmissions, which can be picked up by the telephone wires acting as receiving antenna. Salinger further describes a "VDSL modem" as an example of an embodiment of the apparatus disclosed in Salinger (see e.g. page 8, lines 27-32, page 9, 1-10, page 10, lines 20-27 and page 18, line 16 – page 19, line 2). Thus, Salinger does not disclose, teach or suggest, at least, "a method of

allocating resources in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space," as recited in claim 1; "a transceiver of a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claims 9, 13, 20, and 32-34; "a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claim 25; "a computer program embodied on a computer readable medium executed by a processor in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space," as recited in claims 27 and 30; and "generating a sampled receive signal from a wirelessly received signal;" as recited in claim 1, and similarly recited in claims 9, 13, 25, 27, and 32-33.

Additionally, Salinger does not disclose, teach, or suggest, at least, "deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal," as recited in claim 1, and similarly recited in claims 9, 13, 25, 27, and 32-33.

Salinger discloses a one-short approach for determining the presence of the interference. Referring to pages 13-15, the received samples are processed as blocks of data (cell and clusters). Further referring to pages 22 and 23, "various moments and functions of moments may be calculated for the sample distribution for each cluster, and these moment functions may be compared with the theoretical values for the Rayleigh and Rice distributions." The calculations of these moments and functions are further described in Salinger. In practice, the moments and functions are calculated in a one-shot

manner for the clusters of data samples and then compared with the theoretical values so as to determine whether the samples are Rayleigh or Rician distributed. In contrast, claims 1, 9, 13, 25, 27, and 32-33 recite that the derivation of an interference level threshold is done on the base of a **iterative** statistical analysis of the sampled receive signal. In an iterative process, the same or partially the same data is processed for a number of iterations, and the performance of the statistical analysis is expected to improve during each iteration. Accordingly, Salinger teaches a one-shot approach which is not an iterative process, because a totally new block of data is taken for analysis after the first calculation of the desired moments and functions.

Furthermore, the cited pages of Salinger that the Office Action relies on for the disclosure of "deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal" do not in fact disclose an iterative statistical analysis. Instead, Salinger teaches that the invention uses statistical analysis of the positions of a set of samples in the demodulated symbol constellation to declare that an interferer is present. Salinger does not teach that the invention analyzes the samples in an iterative fashion. Thus, Salinger does not disclose, teach, or suggest, at least, "deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal," as recited in claim 1, and similarly recited in claims 9, 13, 25, 27, and 32-33.

Therefore, Applicants respectfully assert that Salinger fails to disclose, teach or suggest, at least, "a method of allocating resources in a wireless telecommunications

system, wherein wireless signals are transmitted over a signal space," as recited in claim 1; "a transceiver of a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claims 9, 13, 20, and 32-34; "a wireless telecommunication system, wherein wireless signals are transmitted over a signal space," as recited in claim 25; "a computer program embodied on a computer readable medium executed by a processor in a wireless telecommunications system, wherein wireless signals are transmitted over a signal space," as recited in claims 27 and 30. Furthermore, Applicants also respectfully assert that Salinger fails to disclose, teach, or suggest, at least, "generating a sampled receive signal from a wirelessly received signal;" and "deriving an interference level threshold on the basis of an iterative statistical analysis of the sampled receive signal" as recited in claim 1, and similarly recited in claims 9, 13, 25, 27, and 32-33.

Claims 2-8, 10-12, 14-19, 21-24, 26, 28-29, and 31 are dependent upon claims 1, 9, 13, 20, 25, 27, and 30, respectively. Accordingly, claims 2-8, 10-12, 14-19, 21-24, 26, 28-29, and 31 should be allowed for at least their dependence upon claims 1, 9, 13, 20, 25, 27, and 30, and for the specific limitations recited therein.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fail to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-34 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosures: Petition for Extension of Time
Additional Claim Fee Transmittal
Check No. 17326